



November 6, 2007

Ms. Valerie Namba  
Senior Environmental Planner  
California Dept. of General Services, Real Estate Services Division  
Professional Services Branch, Environmental Services Division  
707 Third Street, Suite 3-400  
West Sacramento, CA 95605

Re: Notice of Preparation of EIR for Adoption of Statewide Regulations for Use of PEX Tubing

Dear Ms. Namba:

NSF International is submitting this letter in response to the State of California's Notice of Preparation for an environmental document addressing proposed PEX regulations. This letter provides information relevant to the State's consideration of PEX. NSF International is a not-for-profit organization that provides standards development, product certification, education, and risk-management services for products and processes related to public health and safety. Since its inception over 60 years ago, NSF has been committed to public health, safety, and protection of the environment.

Cross-linked polyethylene (PEX) piping is an approved material in the International Plumbing Code, International Residential Code, and Uniform Plumbing Code. These plumbing codes require PEX piping to be third party certified to applicable standards. The applicable standards are NSF/ANSI Standard 14, NSF/ANSI Standard 61 and ASTM F876 and ASTM F877.

### **ANSI/NSF 61**

NSF/ANSI Standard 61 Drinking Water System Components-Health Effects is the American National Standard for health effects of all drinking water system components. It establishes the requirements for chemical contaminants and impurities that are indirectly imparted to drinking water from products, components and materials used in drinking water systems.

Compliance with NSF/ANSI Standard 61 is required for all drinking water pipe and fittings in all U.S. model plumbing codes and is a requirement in the 2007 California Plumbing Code.

The standard is maintained by a Joint Committee with equal representation from regulators (such as EPA, Health Canada, and state drinking water officials), users (such as water purveyors, utilities, and engineers) and manufacturers. The NSF/ANSI Standard 61 is accredited by the American National Standards Institute, which ensures the standard is developed and maintained using an open, consensus process and assures input by all stakeholders.

### **Evaluation of products under NSF/ANSI 61**

First, a formulation review is performed on the material to determine what possible contaminants could leach out into drinking water. This review determines what type of chemical extraction testing is necessary.

PEX tubing is tested by exposing the tubing to formulated exposure waters, and then analyzing the exposure waters for contaminants. Three separate formulated waters are used during the product exposure. A pH 5.0 and a pH 10.0 exposure water are separately used for exposures as these waters are aggressive toward extraction of metallic contaminants. A pH 8.0 water is used during the exposure for organic based contaminants. The tubing samples containing water are heated to 140°F (60°C), for domestic hot water systems or 180°F (82°C) for commercial systems.

Tubing is conditioned by exposure to the formulated waters for 14 days with water being changed on 10 of those days. The water collected from the final 16-hour exposure period is then analyzed for contaminants. Any contaminants found must be below EPA or Health Canada levels for regulated contaminants. For non-regulated contaminants which are found in the extraction water, NSF/ANSI Standard 61 sets health based pass/fail levels based on review of available toxicity data using the risk assessment procedures in annex A of the standard.

Water exposed to PEX tubing and associated fitting systems are tested for the following contaminants as required by NSF/ANSI Standard 61:

- VOCs (Volatile Organic Compounds)
- Semi-volatile compounds (base neutral acid scan by Gas Chromatography/Mass Spectroscopy)
- Phenolics
- Regulated Metals scan including antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, and thallium
- Methanol
- Tertiary butyl alcohol
- MTBE (methyl tertiary butyl ether)
- Any other potential contaminant identified during the formulation review.

These test methods are capable of detecting contaminants in water as low as 4 parts per billion (4 ppb) and lower, equivalent to 0.0000004% concentration.

## **NSF/ANSI 14**

NSF/ANSI 14 is the American National Standard which establishes the minimum physical and performance requirements for plastic piping system components and related materials. NSF/ANSI Standard 14 requires materials for pressure pipe applications, including PEX, to meet a minimum 50 year long-term strength requirement through establishment of a hydrostatic design stress in accordance with Plastic Pipe Institute Technical Report Number 3.

NSF/ANSI 14 also establishes the minimum quality assurance records, quality control testing and test frequencies required at each production location. PEX piping and fittings are required to meet product design standards such as ASTM F876 and ASTM F877.

ASTM F876 Specification for Crosslinked Polyethylene (PEX) Tubing, contains requirements for the Oxidative Stability in Potable Chlorinated Water Applications. Test method F2023-03, Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water, lists the requirements and test methods for evaluating PEX tubing in

long-term contact with chlorinated water. ASTM F876 requires all PEX pipes used in potable water to be evaluated against the ASTM F2023 test method and have a minimum extrapolated test lifetime of 50 years. The 2007 California Plumbing Code requires compliance with ASTM F876 and F877.

### **Third Party Certification**

Section 3.1.1.1 of the California Plumbing Code requires all products to be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body). The code also defines a listing agency as having a system including initial and ongoing product testing and a periodic inspection on current production of listed (certified) products.

As a third party certification agency NSF International performs at least three unannounced inspections annually of each PEX pipe and fitting production facility certified by NSF. During the inspection, NSF verifies there are no modifications to the product formulation and processing. NSF reviews and observes quality control tests being done by the manufacturer. NSF verifies production is within the requirements of standards to which the products are certified. NSF also collects samples for laboratory retesting of each product family on an annual basis.

Third party certification to consensus, American national standards is the established basis for the acceptance of plumbing products in the United States. The existing American national standards for PEX, which are made applicable in California through the California Plumbing Code, cover the health effects, long term strength, physical and performance and quality requirements.

Please feel free to contact me if you have any questions or would like more information about NSF certification of PEX.

Regards,



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